



BLACKWATER™

PRODUCED WATER TREATMENT UNIT



THE MIOX BLACKWATER TRAILER IS A MOBILE WATER TREATMENT SYSTEM DESIGNED TO MEET HIGH VOLUME DISINFECTION REQUIREMENTS.



This dual-MIOX Mixed Oxidant Solution (MOS) system design can automatically treat fluctuating water quality all within a footprint no larger than 9' by 40'. Safest oxidizing chemistry generated at your site utilizing only brine, water and electricity, when you need it, with ZERO hazardous clean-up or spill procedures. Capable of inexpensive dosing regardless of water quality. When dosed properly, Mixed Oxidant Solution (MOS) chemistry virtually eliminates both sulfate-reducing bacteria (SRB) and acid producing bacteria (APB) which can lower production and foul wellbores.







RIO

MIOX has developed a highly effective disinfection technology for use in the oil and gas industry which creates Mixed Oxidant Solution (MOS) biocide — on location and on the fly. When applied correctly, MOS can completely eliminate SRBs and all other bacteria. MIOX MOS on-site chemical generators have a small footprint, are modular and mobile, require minimal input, and come with a long history of applications. Depending on the specific application, the technology can be applied as a service, lease, or capital purchase.



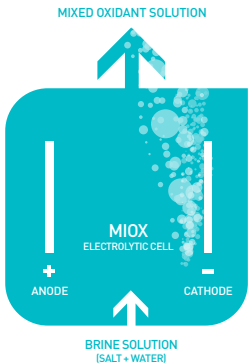
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RECYCLING, REUSING OR TREATING PRODUCED WATER DOES NOT ALWAYS HAVE TO BE EXPENSIVE. Most oil and gas companies manage more water than they do hydrocarbons. While MIOX is not a 100% solution to all produced water treatment needs, it does do the heavy lifting.

Economic, environmental, and operational demands challenge drilling operators to produce results in a highly regulated and competitive environment. MIOX chemical generators offer an efficient, effective, low cost solution for treating high volumes of water and achieve a superior bacterial kill. And because MIOX technology operates with salt, water and electricity, there are virtually no health, safety, spill, or environmental concerns at the well site or down-hole.

ELECTROLYSIS PROCESS



BLACKWATER™ FEATURES

- 5 year cell life warranty
- Simple cam-lock rig-up consisting of 1 brine hose, 1 water hose, dosing hose(s) and power connection.
- Virtually hands-off once rigged-up
- ISO 9001 Certified Manufacturing Facility
- Two (2) RIO on-site generator (OSG) systems include cells with rectifier/power supplies, variable speed brine pumps and controls all mounted in free standing, powder coated corrosion resistant HDPE cabinets.
- Highly efficient electrolytic cell design with low current density for maximum coating life and optimized internal geometry to minimize susceptibility to contaminant clogging.
- Allen Bradley MicroLogix 1200 controls
- Real-time remote monitoring optional
- Integrated controls, pumps and automated dosing
- Self-contained unit with redundancy on all critical path components
- Trainer with controls, wiring, plumbing venting, and anchorage pre-installed by MIOX
- Can be winterized for low temperature operations
- Rugged construction with proven life across multiple industries

MIOX vs. PRODUCED WATER 28 DAY GROWTH, COMPOSITE 50/50 BLEND

Location	Stage	Untreated	50 ppm MOS
Fayetteville	SRB Growth (MPN)	11000000 CFU/ml	43 CFU/ml
	APB Growth (MPN)	11000000 CFU/ml	24 CFU/ml
Woodford	SRB Growth (MPN)	460000 CFU/ml	4 CFU/ml
	APB Growth (MPN)	11000000 CFU/ml	93 CFU/ml

MIOX Mixed Oxidant Solution (MOS) technology does the following:

- Kills bacteria (especially H₂S causing bacteria)
 - Eliminates existing H₂S
 - Treats out ammonia
 - Oxidizes iron (Fe²) and heavy metals
 - Minimal user manpower & service required
 - Small footprint
 - Safest biocide alternative in oil & gas industry
 - Treats at high volume high rate capacity
- On-site chemical generation
 - Low/No manpower requirement
 - Highest Performance vs. Per Barrel Cost
 - Outperforms ozone, UV, chlorine dioxide, electrocoagulation and conventional biocides on cost vs. performance
 - Helps allow reuse and recycling of produced and flowback water
 - Potential to reuse brine/produced water waste streams as feedstock further lowering cost



BLACKWATER™ SPECIFICATIONS

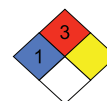
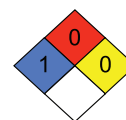
lbs/day FAC Capacity kg/day FAC Capacity	800 lbs/day 362 kg/day
12.5% Bleach Equivalent	800 gal/day 3,028 L/day
Water Treatment Capacity (at 5ppm FAC)	19.2 MGD 450k barrels/day 72k m ³ / day
Salt Conversion (SCE)*	3.0 lb salt / lb FAC 3.0 kg salt / kg FAC
Energy Conversion (ECE)*	3.5 kW-hr / lb FAC 7.7 kW-hr/ kg FAC
FAC Concentration	4,500 mg/L ± 1,000 mg/L
Electrical Service Requirement (OSG only)	480 VAC, 3 ph, 250A, 60 Hz
Generation rate (± 15%)	1,000 gph 3,786 lph
Air Temp. Required	45° F to 105° F 7° C to 40° C
Allowable Feed Water Temp.	40° F to 100° F 4° C to 38° C
Required Feed Water Temp.	50° F to 80° F 10° C to 27° C
Feed Water Pressure	60 to 100 psi 414 to 689 kpa
Dimensions (WxDxH)	8' 8" x 40' x 9' 2.6 m x 12.2 m x 2.7 m
Shipping Weight	19,000 lbs 8,618 kg



A SAFER OXIDANT

When compared to other chemicals, such as conventional biocides, we dramatically reduce exposure on-site. No special clean-up or spill procedures, or potentially expensive air quality testing needs to be observed with MIOX Mixed Oxidant Solution (MOS) chemistry.

NFPA Health Rating
 0-Normal Material
 1-Slight Hazardous
 2-Hazardous
 3-Extreme Danger
 4-Deadly



HAND SANITIZER



GLUTARALDEHYDE



OZONE



CHLORINE DIOXIDE

